

First record of pleasing lacewings (Neuroptera: Dilaridae) in São Paulo state, Brazil

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Abstract: The diversity of the small family Dilaridae in the world includes less than 80 described species, 10 of which known for Brazil. Representatives of the family in Brazil are known for the states of Amazonas, Rondônia, Rio Grande do Norte, Pernambuco, Mato Grosso, Goiás, Mato Grosso do Sul, Rio de Janeiro, Paraná and Santa Catarina. This note includes the first record of the family for the state of São Paulo, with the report of *Nallachius limai* Adams, 1970 in the Parque Estadual Horto Florestal, Campos do Jordão.

Key words: Dilaridae, São Paulo, southern Brazil, Parque Estadual Horto Florestal

Dilaridae, pleasing lacewings, comprises 78 described species in the world (Zhang *et al.* 2014). Two subfamilies are recognized, Dilarinae Newman, 1853 occurring in the Palaearctic and Oriental regions and Nallachiinae Navás, 1914, which occurs principally in the New World, with two species respectively in Vietnam and southern Africa (Grimaldi and Engel 2005). The diversity of the family for the New World is restricted to 18 species of Nallachiinae, all of which belonging to the genus *Nallachius* Navás, 1909 (Oswald 1998; Monserrat 2005). Only ten species are known to occur in Brazil (Table 1).

The most significant difference between subfamilies is the male genitalia. In the Dilarinae the ectoprocts are reduced and their clasping function is transferred to the modified tergite (Acker 1960; Adams 1970). The genitalia consist of a gonarcus with laterally articulated gonocoxites and two submedially



Figure 1. Dorsal habitus of *Nallachius limai* Adams, 1970 (Neuroptera: Dilaridae), male, from Campos do Jordão, state of São Paulo, southeastern Brazil.

articulated mediuncus lobes. Nallachiinae has the ectoprocts developed, often with a pair of modified dorsal lobes abutting on a modified ninth tergite. Are found gonocoxites and mediuncus lobes similar to Dilarinae, and a median sclerite is presented, articulated on the gonarcus (Adams 1970).

Adults resemble hemerobiids, but they are differentiated by ocelli-like tubercles on the head of both sexes. Female dilarids are recognized by their long ovipositor and males by their typically pectinate antennae (Grimaldi and Engel 2005). Their biology is poorly understood, except for the immature stages of *Nallachius americanus* (McLachlan, 1881) (Gurney 1947; Oswald 1998). MacLeod and Spiegler (1961) found larvae of this species under the bark of recently dead trees (*Quercus* and *Liriodendron*). Larvae are predators and were successfully reared on soft-bodied insect larvae and eggs (Penny 1981).

Nallachius limai (Figures 1 and 2) differs from the others Brazilian species by its black labrum and male genitalia with a dorso-lateral plate in the gonarcus. The head is pale, and the frons and vertex broadly fuscous; the vertex tubercles are pale and of the same size. Male have the antennae with 14-16 branches. The thorax and the abdomen are fuscous. The wings are broad and rounded, with a wide costal area and numerous longitudinal veins forked (Adams 1970).

The male holotype, three males and one female paratypes of *Nallachius limai* were collected in Nova Teutônia, state of Santa Catarina. Machado and Rafael (2010) examined seven specimens from the state of Paraná conspecific with the

Table 1. Distribution of Brazilian Dilaridae (Neuroptera) species.

Dilaridae species	States
<i>Nallachius adamsi</i> Penny, 1981	Amazonas
<i>N. bicolor</i> Adams, 1970	Mato Grosso, Goiás, Santa Catarina
<i>N. furcatus</i> Machado & Rafael, 2010	Pernambuco
<i>N. infuscatus</i> Penny, 1981	Amazonas, Rondônia
<i>N. limai</i> Adams, 1970	São Paulo (new record), Paraná, Santa Catarina
<i>N. maculatus</i> Penny, 1981	Rondônia
<i>N. ovalis</i> Adams, 1970	Santa Catarina
<i>N. phantomellus</i> Adams, 1970	Mato Grosso do Sul
<i>N. potiguar</i> Machado & Rafael, 2010	Rio Grande do Norte
<i>N. prestoni</i> (McLachlan, 1880)	Rio de Janeiro

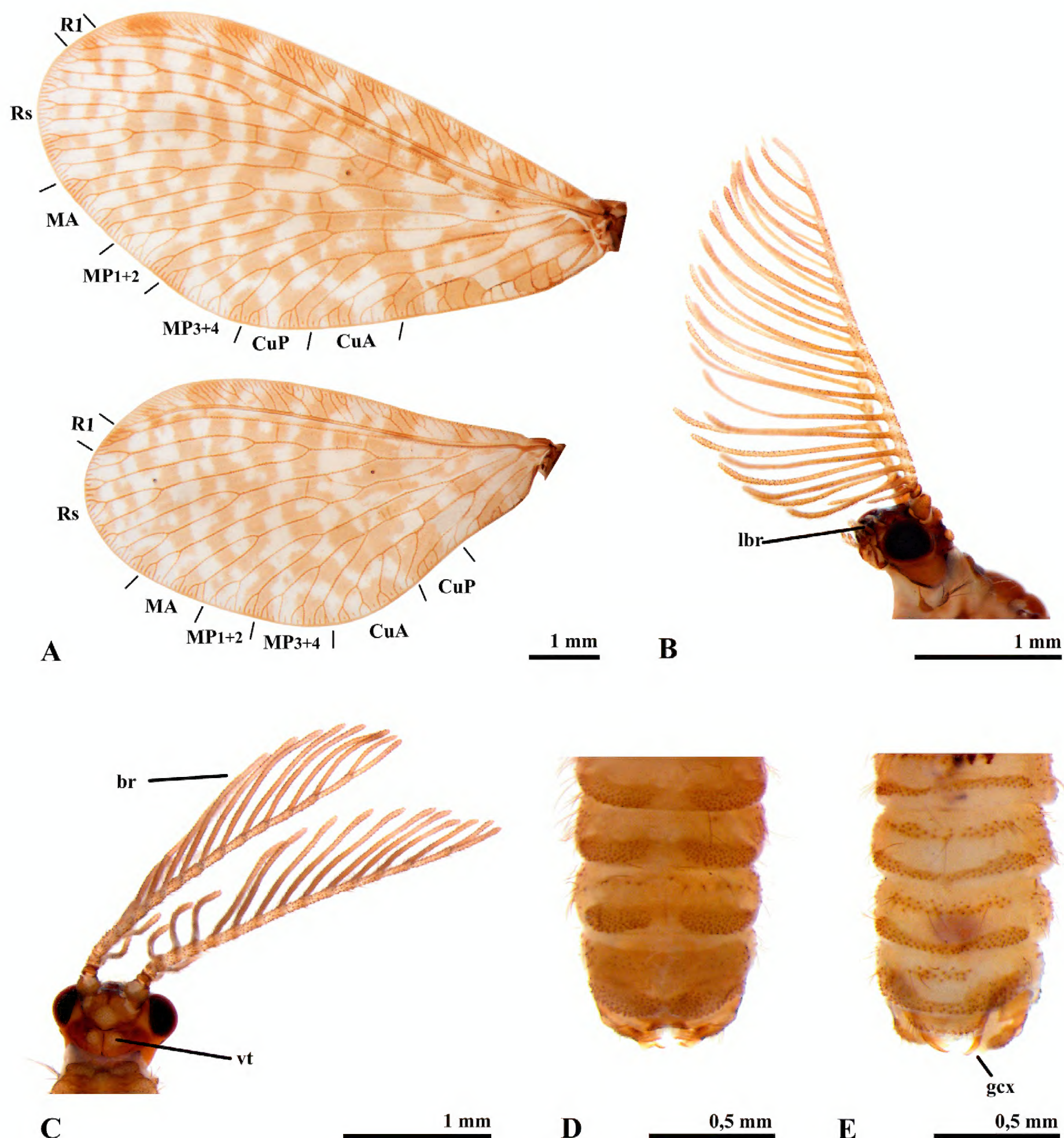


Figure 2. Male of *Nallachius limai* Adams, 1970 (Neuroptera: Dilaridae) from Campos do Jordão, state of São Paulo, southeastern Brazil. **A:** Forewing and hindwing. **B:** Head and antennae, lateral view. **C:** Head and antennae, dorsal view. **D:** Abdominal apex, dorsal view. **E:** Abdominal apex, ventral view. Branches of antennae (br); gonocoxite (gcx); black labrum (lbr); vertex tubercles (vt); radius (R1); radial sector (Rs); media anterior (MA); media posterior (MP); cubitus anterior (CuA); cubitus posterior (CuP).

holotype: four males from Piraqua, two males from Tijucas do Sul, and one female from Tirol das Torres.

This note reports the first record of *N. limai* for the state of São Paulo (Figure 3). One male was collected with a Malaise trap on 22 November 2010 in Parque Estadual Horto Florestal (22°40'57" S, 045°27'11" W), Campos do Jordão. This biological station was created in 1941 for an area of 8.341 hectares with an important remnant of Atlantic Forest having a mosaic with three distinct facies: the forest with *Araucaria* and *Podocarpus*, altitude fields and cloud woods (Governo do Estado de São Paulo 2014). Actually, it has been shown for several groups (Calor *et al.* 2006; Falaschi and Amorim 2009; Oliveira and Amorim 2010) that the fauna in higher altitudes in the states



Figure 3. Geographic distribution of *Nallachius limai* Adams, 1970 (Neuroptera: Dilaridae).

of São Paulo, Rio de Janeiro and Minas Gerais is very similar to that of the pretty well known area in Nova Teutonia where Fritz Plaumann has collected for nearly 70 years decades, in the state of Santa Catarina.

The identification of *N. limai* was made using the key in Machado and Rafael (2010) and the original description of the species by Adams (1970). The specimen was deposited at the Museu de Zoologia da Universidade de São Paulo (MZUSP).

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LITERATURE CITED

- Acker, T.S. 1960. The comparative morphology of the male terminalia of Neuroptera (Insecta). *Microentomology* 24: 25–84.
- Adams, P.A. 1970. A review of the New World Dilaridae. *Postilla* 148: 1–30.
- Calor, A.R., R.W. Holzenthal. and D.S. Amorim. 2006. Phylogenetic analysis of *Notalina* (*Neonotalina*) Holzenthal (Trichoptera: Leptoceridae), with the description of two new species from southeastern Brazil. *Zootaxa* 1131: 33–48.
- Falaschi, R.L. and D.S. Amorim. 2009. Revision of the Neotropical Ditomyiidae (Diptera, Bibionomorpha). 1. The genus *Nervijuncta* Marshall, 1896 (Diptera, Ditomyiidae, Ditomyiinae). *Zootaxa* 2219: 18–30.
- Governo do Estado de São Paulo. Sobre o Parque Estadual Horto Florestal. Available at <http://www.ambiente.sp.gov.br/parque-campos-do-jordao/sobre-o-parque/>. Captured on 26 June 2014.
- Grimaldi, D. and M.S. Engel. 2005. *Evolution of the Insects*. New York: Cambridge University Press. 755 pp.
- Gurney, A.B. 1947. Notes on Dilaridae and Berothidae, with special reference to the immature stages of the Nearctic genera (Neuroptera). *Psyche* 54 (3): 145–169 (doi: [10.1155/1947/78317](https://doi.org/10.1155/1947/78317)).
- Machado, R.J.S. and J.A. Rafael. 2010. Two new species of Dilaridae (Insecta: Neuroptera) with additional notes on Brazilian species. *Zootaxa* 2421: 61–68.
- MacLeod, E.G. and P.E. Spiegler. 1961. Notes on the larval habitat and developmental peculiarities of *Nallachius americanus* (MacLachlan) (Neuroptera: Dilaridae). *Proceedings of Entomological Society of Washington* 63: 281–286.
- Monserat, V.J. 2005. Nuevos datos sobre algunas pequeñas familias de neurópteros (Insecta: Neuroptera: Nevrothidae, Osmylidae, Sisyridae, Dilaridae). *Heteropterus: Revista de Entomologia* 5: 1–26 (http://www.heteropterus.org/pdf/n5/Heteropterus_Rev_Entomol_5_1-26.pdf).
- Oliveira, S.S. and D.S. Amorim. 2010. Four new species of *Paratrizygia* Tonnoir from the Brazilian Atlantic Forest (Diptera, Mycetophilidae, Sciophilinae). *Zootaxa* 2629: 29–46 (<http://www.mapress.com/zootaxa/2010/1/zto2629p046.pdf>).
- Oswald, J.D. 1998. Annotated catalogue of the Dilaridae (Insecta: Neuroptera) of the world. *Tijdschrift voor Entomologie* 141: 115–128.
- Penny, N.D. 1981. Neuroptera of the Amazon Basin. Part 2. Dilaridae. *Acta Amazonica* 11: 383–390 (<https://acta.inpa.gov.br/fasciculos/11-2/PDF/v11n2a20.pdf>).
- Zhang, W., Liu, X.Y., Aspöck, H. and Aspöck, U. 2014. Revision of Chinese Dilaridae (Insecta: Neuroptera) (Part I): Species of the genus *Dilar* Rambur from northern China. *Zootaxa* 3753(1): 1–24 (doi: [10.11646/zootaxa.3753.1.2](https://doi.org/10.11646/zootaxa.3753.1.2)).

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